DOCUMENT RESUME

ED 117 363 CE 005 986

AUTHOR Dudgeon, Paul J.
TITLE Arriving at Individualization and Personalization: A Set of Elements.
PUB DATE Nov 75
NOTE 27p.; For related bibliography, see CE 005 987

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage
DESCRIPTORS Educational Counseling; Educational Facilities; Educational Philosophy; Educational Planning; *Educational Programs; *Individualized Instruction; *Individualized Programs; *Program Content; Program Design; Program Development; Students; Teacher Role; Teachers; *Teaching Methods

ABSTRACT

Individualized and personalized (I and P) programs place learners at the center of all the activity. The eight main elements of such programs are: philosophical and taxonomic considerations; instructors as resource persons and learning managers; peer tutoring, personal and academic counseling, and cognitive style maps of students; instruction employing such techniques as pre- and posttesting, computerized data banking, individual diagnosis, and designed instructional mediation; financial prioritization; inservice training for administrators and educators, and individualized student orientation; open architecture of physical facilities; computerized management information and evaluation systems; and accountability and planning models. The development of the elements of the I and P program is a dynamic process. Since the computer, a full range of mediation, and paraprofessionals can adequately dispense information, instructors are able to become designers and managers of learning, prescribers of instructional material, and interpreters of evaluation data. Instructors are able to select a proper mix of a large variety of elements and tools for each individual student. Educational technology thus does not replace instructors; it merely frees them to humanize the educational process. (Half the document consists of explanatory notes of terminology used in the text.) (JR)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED117363

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDULATION POSITION OR POLICY

ARRIVING AT INDIVIDUALIZATION & PERSONALIZATION:

A SET OF ELEMENTS

Paul J. Dudgeon
Dean, Continuing Education
Canadore College
North Bay, Ontario, Canada

November 1975

CE005988

The author describes a set of elements that he considers essential for any program claiming to be individualized and personalized. These elements are based on his experiences in the implementation and management of innovative individualized and personalized education programs in the Continuing Education Division, Canadore College, North Bay.

Introduction to the Process of Individualization and Personalization

A variety of rapid changes has recently taken place in education. Many of these changes focus on the way we meet the needs of each student and respond to individual differences, or what is commonly labelled "individualization and personalization," (also referred to as I and P).

Most educators do not find such changes unpalatable, but developing procedures, techniques, and policies to make these changes is a much more demanding task than most envisage.

What is "individualization and personalization" and how does it differ from the traditional approach to education and specifically instruction? An individualized and personalized program is one that places the learner at the centre of all the activity. Lister Sinclair, said:

> "A tide of youth is rising, a generation, waiting, counting on us. They arrived at a decisive moment in human history. They must learn more, learn better and learn faster, than ever before. They are faced with a sea of information that modern life

> demands. They must master it or drown. Much of what they are now being taught is obsolete and much of what they will need to know has not yet been discovered. They must continue to learn until the end of their days.
>
> In a scientific and technological age, education is the key to strength. A nation which does not value trained intelligence is doomed. The 'beep beep' of a Russian satellite in 1957 sounded the alarm challenging American self-assurance, questioning the teaching of science and techniques. Sputnik, that ominous visual aid, appeared like a new star in the sky of educational tradition. The whole science of schooling was put in doubt. What is teaching? What is learning? Appeals were made to psychology, to cybernetics, the great foundations poured money into experiments which are still being discussed. All the results are not in, but the copernican revolution in education begun in the 17th century is underway to put the learner, rather than the teacher at the centre of the educational process."[1]

Today many colleges are attempting to place a new emphasis on the learner by implementing an individualized and personalized approach to instruction.

Individualization & Personalization as a Process Consisting of Many Elements

Is a program individualized and personalized if we have large, open areas full of sophisticated hardware? or if we declare it an "open program" with classrooms? Let me state

[1]By permission of Lister Sinclair, Vice Pres., Program Policy and Development, Canadian Broadcasting Corporation, 1975.

categorically that these programs are not based simply upon open rooms and the sophistication and quantity of the hardware. These are but two elements in the individualized and personalized process of education programs. Too many educational administrators today have an architectural concept of I & P which often results either in the failure of or dissatisfaction with the rest of the process. Successful I & P education programs are based on the eclectic selection and integrated implementation of a great many elements in the I & P process. If an element is missing, problems will be encountered and we will be tempted to "throw the baby out with the bathwater."

Main Elements of the Individualization and Personalization Process

> Most fully individualized and personalized education programs contain a large proportion of the following elements which comprise an instructional systems technology.[1]

A. PHILOSOPHICAL & TAXONOMIC CONSIDERATIONS

(a) An orientation to I & P that blends educational technology and educational humanism.

(b) A confluent (behavioristic/humanistic) orientation to the cognitive and affective domains.

(c) Objectives that adhere to a confluent learning approach; i.e., the affective or emotional should not be ignored at the expense of the cognitive or content objectives.

(d) Objectives to be written with attention to the various taxonomies and taxonomic levels.

B. INSTRUCTORS

(a) Instructors in I & P programs are used as resource persons and learning managers. They organize the elements (of the set) to help the student achieve the agreed upon objectives of his or her educational program. Presenting information is no longer a major function of instructors.

(b) Instructors in individualized and personalized programs have more time to spend with each student, and are able to work with more students than is the case in traditional programs.

(c) Individualization and personalization includes a large number of elements and tools. An effective instructor creates an individualized process that is intellectually honest by selecting the proper mix for each individual student.

(d) Paraprofessionals are used in individualized and personalized programs to assist the instructors and students. They can perform a variety of tasks that can be specified and arranged in a hierarchy demonstrating different performance levels.

C. STUDENTS

(a) I & P programs allow for student inputs in design and evaluation.

(b) Peer tutoring is a program element; peer tutors should be paid for their service.

(c) Personal and academic counselling is available to all students with regard to their individual needs. Counsellors must have faculty involvement with regard to learning problems. Faculty and counsellors utilize cognitive style mapping as one tool in the learning process.

A cognitive style map is a picture of the way a student derives meaning from his environment and personal experience. It identifies the modes (e.g., listening and reading) in which a student can master an educational task most readily, thereby contributing to efficient management of instructional resources. Further information is available on cognitive style mapping under "note 6".

D. INSTRUCTION

(a) Individual diagnosis of learning problems.

(b) Pre-tests and post-tests.

(c) Prescriptions for each student after pre-testing and diagnosis of need.

(d) Criterion-referenced measurement system.[2]

(e) Content sequenced from the lowest to highest across levels.

(f) Social and material reinforcement for learning.

(g) Behavioral objectives.

(h) The use of the generic objective.[3] This is a content free, standardized form of a behavioral objective.

(i) Computerized data banking of objectives, test items and resources. Data banking necessitates a content classification system.

(j) Mediate[4] instruction by design rather than by chance. This is achieved through the educational sciences and specifically cognitive style mapping.[5 + 6]

E. FINANCIAL

(a) Financial priorities are determined to achieve the innovative educational objectives of the school.

F. COUNSELLING, TRAINING & ORIENTATION

(a) Behavior therapy (test desensitization, etc.)

(b) Counsellors in a partnership with students, faculty, paraprofessionals and administrators. The goal is learning and the solution of learning problems.

(c) In-service training for administrators, counsellors, faculty, and paraprofessionals.

(d) Individualized student orientation to the new methods and processes.

(e) An extensive individualized professional development program, supervised by an educational development officer, available to all campus personnel.

G. PHYSICAL FACILITIES

(a) An open architecture or the innovative use of traditional space.

(b) Priorities established to acquire the necessary hardware or equipment usually required in individualized and personalized programs. This hardware must be available in sufficient quantities for the new methodologies.

(c) An extensive variety of software either purchased, developed, or adapted to meet the instructional objectives.

H. MANAGEMENT INFORMATION, EVALUATION SYSTEMS, ACCOUNTABILITY AND PLANNING

(a) A computer-managed information system to be established to complete as much routine work as possible. Computer managed instruction (CMI) implies a sophisticated, flexible system. This can be distinguished from computer assisted instruction (CAI) which is one instructional delivery mode. The objective of CMI is to have a total management information system delivering accurate information at the appropriate time to the educational users who must make critical decisions, ie., administrators, faculty, paraprofessionals, counsellors and students.

(b) A computerized sophisticated evaluation system to be adopted or developed. The system should have the following major capabilities:

i economize testing through the use of sampling techniques;

ii provide pre-test and post-test data;

iii provide information on student achievement by objectives, student achievement by manager, total group achievement, achievement by time and content area;

iv provide curriculum analysis and validation assisted by the computer;

v measure retention over time;

vi use curriculum embedded tests to monitor achievement;

vii allow for greater student management of learning;

viii furnish formative as well as summative evaluation data for curriculum revision;

ix be computer managed for maximum efficiency in evaluating large numbers of students.[7]

(c) Accountability models should be used and all members of the educational organization should be held accountable for student learning outcomes. Administrators should not hold persons responsible for outcomes over which they have no control. The use of accountability models assumes that all the elements of individualization and personalization necessary to achievement have been provided.

(d) A planning method must be used to solve complex problems resulting from the interrelationship of individualization and personalization elements. Anasynthesis, the process of analysis, synthesis, modeling and simulation, is a form of systems analysis and an excellent method for educators.[8]

DISCUSSION

Elements - Use, Misuse & Results: I have listed the main elements to demonstrate that a fully individualized and personalized education program is not just an open classroom or a sheet of rote-memory-level behavioral objectives. Most of the criticism I hear about the systems approach to instruction or I & P programs is leveled at the misuse of that system. Before we can criticize the worth of an I & P program we must be sure that we are criticizing a process that includes most if not all, the elements necessary to its success in a given learning environment. In short, we must be sure we are criticizing a process that has enough elements to be termed individualized and personalized. An education program cannot be fully individualized and personalized in a week or two by a "declaration of individualization."

Instructional systems technology is a new field and innovations are being made constantly. The development of the set of elements listed in this paper is a dynamic rather than a static process. Using these elements, instructors and students achieve substantially better results and now have the means to measure much of what actually takes place. Before programs are individualized and personalized through the use of an instructional systems approach, results usually can't be measured.

Instructors in an I & P program have more time with each student, and in most cases are able to work with many more students than in traditional programs.

Humanizing or Dehumanizing:

Despite some criticism, I & P programs are not dehumanizing. However, if there is a pretence of individualization and personalization, if only a few elements are used, learning can be dehumanized. After the students, instructors are the most important aspect in an I & P program. In such programs they are released from many of the "non-human" tasks and can better use their professional judgment in their new role as managers of learning, and concentrate on the humanizing aspects of education.

The Instructor as Manager of Instruction

The instructor is a manager who arranges the elements of the set in an organized manner to help the student achieve the agreed upon objectives of the student's education program. Success means that there is a match between the objectives of the student's program and the student's learning outcomes.

The elements of I & P place the instructor in the role of designer and manager of learning rather than as the provider and dispenser of information. Much of this last function is fulfilled by the computer, a full range of mediation, and paraprofessionals. The instructor is the professional resource person, the diagnostician, the prescriber of instructional material, the interpreter of evaluation data; in short, the humanizer of the educational process. When many persons first individualize and personalize, they spend more time diagnosing and testing than actually helping students learn.

Sampling technique should be used to reduce testing in I & P programs. Sometimes educators are tempted to interfere too much in the learning process when interference is not necessary. There is often a reluctance to permit students to manage even a portion of their own learning. Curriculum-embedded tests are viewed with suspicion because their role is not understood. Sampling techniques are neglected in education -- those very techniques business schools promote so that industry does not place the product's cost beyond the consumer's reach.

It is my opinion that we have a tendency to produce reams of mediation without considering that we often mediate by chance. Granted, behavioral objectives and criterion-referenced measurement can help students to learn by design rather than by chance, but we forget that we are mediating by chance.

A common misconception of I & P states that educational technology in such programs replaces the instructor. This is definitely not the case. Instructors may find themselves in a new role as managers of learning rather than as presenters of information. The educational sciences emphasize that some students learn best by lectures, consequently lectures and competent lecturers are an important component in an I & P learning program.

Selecting the Proper Mix of Elements for each Student

I & P is composed of a large number of elements and tools. The effective instructor is a manager who can select the proper mix for each individual student. An individualized process that is intellectually honest is simply one in which the managers use all of the available tools and select the proper mix for each student.

When I taught International Marketing at university, I was very involved with a concept called "The Marketing Mix." This concept required the student to consider all the elements of marketing and select the proper mix of elements to solve a specific marketing problem. I submit that there is a set of elements in I & P and it is from that set that we must select the proper mix for each student.

Having outlined the problems of creating a fully individualized and personalized process, I don't want to discourage you. You can begin . . . gradually! I may mention that no one has the "perfect" package. Most attempts at I & P are eclectic and involve simply plain hard work. First, you can begin by writing objectives and progress to higher and higher levels of sophistication (don't forget that today a great deal of material can be obtained commercially). This should save you a great deal of time and money in the long run.

CONCLUSION

In closing, it is my sincere hope, that my experiences will stimulate you to implement an I & P educational program. I hope you will participate actively in attempting to solve the many problems that still exist in the implementation and management of I & P programs.

NOTES

1 INSTRUCTIONAL SYSTEMS TECHNOLOGY

This is a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communication, employing a combination of human and non-human resources to bring about more effective instruction.[1]

[1] "Six Characteristics in Search of a Profession, An Intellectual Technique" Howard B. Hitchens Jr. Audiovisual Instruction November 1971, pp. 101-102

2 MEASUREMENT

There are two approaches to measurement in education programs:

- Norm-referenced measurement is used to identify an individual's performance in relation to the performance of others on the same measure.
- Norm-referenced measures are devised to facilitate comparisons among individuals.
- Criterion-referenced measurement is used to identify an individual's status with respect to an established standard of performance. The individual is compared with some established criterion rather than other individuals[1]

Criterion-Referenced Reliability: For norm-referenced measures the classical concepts of reliability apply, but for criterion-referenced measures they are inappropriate. If, after instruction, everyone scores perfectly on a test that reflects accurately the instructional objectives, the test need not be faulted if it produced no variability, hence a zero reliability co-efficient.[2]

Content Validity: Criterion-referenced measures are validated primarily in terms of the adequacy with which they represent the criterion. A carefully made judgment, based on the test's

[1] "Criterion-Referenced Measurement," W. James Popham, Editor, Educational Technology Publication, (1971)

[2] Modern Measurement Methods from the Prentice-Hall Teacher Competency Development System by W. James Popham & Eva L. Baker, Copyright 1973. By permission of Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

apparent relevance to the behaviors delimited by the criterion is the best procedure for validating criterion-referenced measures. This judgment-based operation is referred to as content validity. The more precisely instructional objectives can be explicated, the more accurately judgments can be reached regarding a test's content validity.[3]

Domain Referenced Achievement Testing: Measurement specialists such as Wells Hively have devised techniques to increase the precision with which content validity can be determined.

For each measurably scaled instructional objective an "item form" is written delimiting the form of the test items which may legitimately be used to assess whether the objective has been achieved. In this sense, the domain of eligible test items has been defined and therefore this approach is called "Domain Referenced Achievement Testing."[4]

Item Sampling: Both norm-referenced and criterion-referenced measures that are used to make decisions regarding individuals require the same test, or an equivalert form, be used with each individual. However, criterion-referenced tests used for evaluating instructional programs need not be the same for everyone. The concept of item sampling (sometimes referred to

[3]Ibid., p. 13

[4]Modern Measurement Methods from the Prentice-Hall Teacher Competency Development System by W. James Popham & Eva L. Baker, Copyright 1973. By permission of Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

as matrix sampling) in which different people complete different items, thereby permitting the sampling of more behavior with shorter tests, is highly appropriate for evaluating instructional sequences.[5]

Formative Evaluation: is an instructional sequence evaluated to improve the sequence itself.

Summative Evaluation: is the worth of a completed instructional sequence appraised (in comparison with competing sequences).[6]

[5]Ibid., p. 16.

[6]Current Conceptions of Educational Evaluation from the Prentice-Hall Teacher Competency Development System by W. James Popham & Eva L. Baker, Copyright 1973. By permission of Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

3 GENERIC OBJECTIVE: The "generic objective" (GO) is a standardized format for a behaviourally-oriented objective that is both specific and general. It is specific in that it describes the type of stimulus to be given, states how the stimulus will be presented and limits the student response to a particular behaviour. It is general in that it does not cite the specific stimulus material or content to be used. If the objective in any course (including skill) can be expressed behaviourally, it can be formulated as a generic objective.[1 & 2]

[1] O'Reilly, Robert, Gorth, William & Pinsky, Paul. Comprehensive Achievement Monitoring. Amherst, Massachusetts: University of Massachusetts, School of Education.

[2] Further information on the application of Comprehensive Achievement Monitoring at Canadore College Continuing Education Division is available from Paul J. Dudgeon, Dean, Continuing Education.

4 MEDIATE: To mediate is to make available a variety of instructional delivery modes or communication vehicles for each instructional objective. A fully mediated program would be based upon:

1. The use of hardware such as audio recorders and playback units, computers, video-cassette recording and playback units, overhead transparency and filmstrip production equipment.
2. The use of print and non-print software such as audio cassettes containing course material, computer programs and CAI programs, video-cassettes containing course material, transparencies and filmstrips containing course material and textbooks.
3. The availability and use of a variety of presentation formats for each objective such as lecture, seminar, lecture-discussion, independent study, tutorial and programmed instruction.

Mediation: Mediation is a complex subject and mediation of instruction by design can be understood best by a study of the Educational Sciences and Cognitive Style Mapping. Mediation of instruction by design means choosing the optimum mix of communication vehicles so each student receives instruction according to their individual cognitive style.[1]

[1]Dudgeon, Paul J. Dean, Continuing Education Division, Canadore College, North Bay, Ontario.

5 THE EDUCATIONAL SCIENCES

The seven educational sciences as defined by Dr. Joseph Hill are:

1. symbols and their meanings
2. cultural determinants of the meanings of symbols
3. modalities of inference
4. biochemical and electrophysiological aspects of memory
5. cognitive styles of individuals
6. teaching styles, administrative styles, and counselling styles
7. systemic analysis and decision making.[1]

In educational programs a knowledge of the educational sciences is essential if we wish to individualize and personalize. The educational sciences stress that a knowledge of administrator, faculty, counsellor and student styles ensures that mediation will occur by design. This approach enables educators to take a success-oriented approach to avoid failing students and wasting their time due to a lack of sophisticated style information that can be provided through an analysis of cognitive style. The vehicle for cognitive style analysis is a computer produced cognitive style map derived from test results.[2]

[1]The Educational Sciences, Dr. Joseph Hill, President, Oakland Community College, Bloomfield Hills, Michigan.

[2]Paul J. Dudgeon, Dean, Continuing Education Division, Canadore College, North Bay, Ontario.

6 COGNITIVE STYLE MAPPING: A cognitive style map is a picture of the way a student derives meaning from his environment and personal experience. Each map, like each student, is unique and different. A student's cognitive style is determined by the way he takes notice of his total surroundings: how he seeks meaning, how he becomes informed. Is he a listener or a reader? Is he concerned only with his point of view or is he influenced in decision-making by his family or group associates? Does he reason more like a mathematician or a social scientist?

A cognitive style map identifies the modes in which a student can master an educational task most readily, thereby contributing to the effective managment of instructional resources. A cognitive style map provides the individual with the self-knowledge essential to pursuing realistic career goals. Since cognitive style is not immutable, it can be augmented. Missing strengths required for a specific occupation can be built up on a student's existing strengths. Using the individual's cognitive style map and subjective information gathered in private conversation, a team of instructors with the student develop a personalized education program geared to the student's strengths and weaknesses - a program that is a personal educational prescription and will promote success. A computer may be used to expedite the process.[1]

[1]Further information about the educational sciences and their use in education can be obtained from:

(a) Dr. Joseph Hill, President, Oakland Community College, Bloomfield Hills, Michigan,

(b) Paul J. Dudgeon, Dean, Continuing Education, Canadore College, North Bay, Ontario.

7 CANADORE COMPREHENSIVE ACHIEVEMENT MONITORING (CAM)

The Canadore Continuing Education Division Comprehensive Achievement Monitoring (CAM) mathematics system fulfills all of the above requirements for both CMI and a computerized evaluation system. (Several papers on the Canadore CAM are available from Dean Paul Dudgeon at Canadore College.)

CAM provides an innovative, effective means of evaluating student performances for a particular course of study whether it is conventional or experimental in nature.

The Canadore Math CAM provides:

1. a complete achievement profile for each student on a continuous basis.
2. information on any student's performance by objectives, by manager, and many concomitant variables, as well as total group achievement by time and content area.
3. the detection of learning, non-learning, forgetting and retention.
4. diminished testing jitters. Students find the CAM approach to evaluation refreshing - boredom and apathy are effectively countered.
5. a course structure which is not fixed or rigid. The structure is open to manager preference.
6. continuous intake and exit. It is now possible to have any student start and stop at any point in the curriculum.
7. continuous feedback to administrators, managers and students.
8. formative and summative evaluation in a systematic fashion.

9. cost reduction. Costs associated with the retrieval of evaluation data have been reduced stubstantially through CAM's sampling technique.
10. an important tool for instructional decision-making. Decisions relating to re-teaching, omitting, condensing, adding to, digressing from, altering and re-forming instructional groups tasks and sequences can now be made on a sound basis.
11. computer-assisted curriculum analysis and validation.[1]

[1]Dudgeon, Paul J. Learner at the Centre. A Project in the Management of Instruction. Canadore College, Continuing Education Division, North Bay, Ontario.

8. ANASYTHESIS

A system is defined as the structure or organization of an orderly whole, clearly showing interrelations of the parts to each other and to the whole itself.

The process of analysis, synthesis, modeling and simulation is called anasynthesis.

- Analysis is performed on existing information to identify the problem, existing elements (e), and their interrelationships (i).
- Synthesis is performed to combine unrelated elements into a new whole.
- Models that can predict effectiveness before actual implementation of the system are constructed.
- Simulation is performed using these models to produce alternative solutions.
- A model is a conceptualization in the form of a mathematical (or other) equation, a physical device, a narrative consisting of words and/or symbols, or a graphic analog such as a flowchart.
- Models are constructed to represent real-life situations. The faithfulness of this representation is known as fidelity.
- The modeling to which anasynthesis refers is customarily flow-chart and mathematical models.
- Whenever possible, mathematical models are preferred.

Anasynthesis has discrete steps and is a definitive process. It can be applied to all aspects of education and is not necessarily limited to analyzing, synthesizing, modeling and simulating in the curriculum development domain. In this sense, it is characteristic of general systems theory which deals with a set of rules common to all systems.

Anasynthesis is utilized to obtain solutions in complex systems. When is a system complex? Complexity is simply a function of the number of elements (e) and the number of interrelationships (i):

$$C = f(e,i)$$

In a flowchart model consisting of rectangles containing descriptors and signal paths or arrows containing information, as in figure 1, the rectangles are elements (e), and the signal paths represent interrelationships (i). Thus, a large system with many e and i will be more complex than a small system having only a few e and i.[1 + 2]

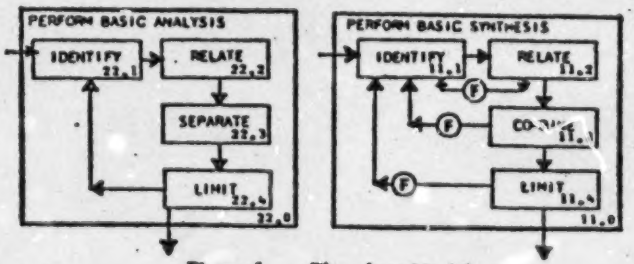

Figure 1 Flowchart Model

[1]Silvern, Leonard C. Education and Training Consultants, California

[2]For a detailed overview of Canadore's use of anasynthesis see "An Instructional Systems Technology Model for Institutional Change" ERIC ED 099 095.